CLAIMS

1. (CURRENTLY AMENDED) A method of forming an addressable array of chemical moieties on a substrate, comprising:

(a) for each of multiple locations on the substrate, depositing a reagent drop set during a cycle so as to attach a corresponding moiety for that location; and

(b) repeating step (a) if required, until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is deposited over one or more cycles of (a) and (b) for a corresponding location which group includes drops which are deposited from different dispensers;

the method additionally comprising: see pg 8 line 22 + claim 6

(c) depositing and detecting drops at respective separate locations on the substrate from different dispensers which deposit a multi-dispenser drop group.

2. (ORIGINAL) A method according to claim 1 wherein drops of the multi-dispenser drop group in step (c) are not independently detected at the corresponding location in step (b).

3. (CURRENTLY AMENDED) A method according to claim 1 wherein a multi-dispenser drop group comprises a drop including an attachment moiety which becomes attached at the location at which the ~~group~~ drop is deposited in step (a) or (b) but which does not become attached at a location in step (c).

4. (CURRENTLY AMENDED) A method according to claim 1 wherein a multi-dispenser drop group comprises a drop including an attachment moiety which will become attached at the location at which the ~~group~~ drop is deposited upon activation by an activator, and at least one other drop comprises the activator moiety, such that the attachment moiety and activator are deposited at separate locations in step (c).

5. (CURRENTLY AMENDED) A method according to claim 1 wherein in (c) drops are deposited and detected at respective separate locations on the substrate from

all those dispensers which deposit a multi-dispenser drop group.

6. (CURRENTLY AMENDED) A method according to claim 2 wherein in step (c) the drops are detected on the separate locations on the substrate.

7. (ORIGINAL) A method according to claim 1 additionally comprising capturing an image of drops deposited during step (c).

8. (ORIGINAL) A method according to claim 6 additionally comprising evaluating results from the detecting for an indication of a dispenser error and, when an error is detected, discarding the array or depositing further drops to correct the error.

9. (ORIGINAL) A method according to claim 6 additionally comprising saving results from the detecting in a memory.

10. (ORIGINAL) A method according to claim 6 additionally comprising evaluating results from the detecting based at least in part on a cycle during which the results were obtained.

11. (ORIGINAL) A method according to claim 10 wherein results from detecting during multiple cycles are obtained and the evaluation is based at least in part on the cycles during which the results were obtained.

12. (ORIGINAL) A method according to claim 2 additionally comprising adjusting a parameter of the dispensing in step (a) based at least in part on the results from step (c).

13. (ORIGINAL) A method according to claim 1 wherein in step (c) replicates of a same drop from a same dispenser are deposited at multiple different locations on the substrate, the method additionally comprising evaluating a characteristic of the substrate based on the results of detecting the replicates.

14. (ORIGINAL) A method according to claim 1 additionally comprising evaluating dispenser performance based on relative characteristics of drops of different composition deposited from different dispensers.

15. (ORIGINAL) A method according to claim 1 wherein during step (a) or (b) drops of multi-dispenser drop groups are deposited at respective substrate locations such that one drop of the group contacts a previously deposited drop of the same group at the same location.

16. (ORIGINAL) A method according to claim 2 wherein different multi-dispenser drop groups have at least one drop deposited by a same dispenser and another drop deposited by a different dispenser.

17. (CURRENTLY AMENDED) A method according to claim 2 wherein the at least some of the drops of a multi-dispenser drop ~~set~~ group are of a different composition.

18. (ORIGINAL) A method according to claim 2 wherein at least one of the drops of different multi-dispenser drop groups are deposited from a same dispenser.

19. (ORIGINAL) A method according to claim 1 wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (a) or (b), and wherein the drops deposited and detected in step (c) are deposited in a test pattern area separate from the array.

20. (CURRENTLY AMENDED) A method of forming an addressable array of chemical moieties on a substrate, comprising:

(a) for each of multiple locations on the substrate, depositing a reagent drop set during a cycle so as to attach a corresponding moiety for that location; and

(b) repeating step (a) if required, until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is

deposited over one or more cycles of (a) and (b) for a corresponding location which group includes drops which are deposited from different dispensers;

the method additionally comprising:

(c) depositing and detecting drops from different dispensers which deposit a multi-dispenser drop group, onto the substrate at respective separate locations in a test pattern area separate from the array.

21. (CURRENTLY AMENDED) A method according to claim 20 wherein a multi-dispenser drop group comprises a drop including an attachment moiety which becomes attached at the location at which the ~~group~~ drop is deposited in step (a) or (b) but which does not become attached at a location in step (c).

22. (ORIGINAL) A method according to claim 20 wherein a multi-dispenser drop group comprises a drop containing an attachment moiety which will become attached at that location upon activation by an activator, and at least one other drop containing the activator moiety, such that the attachment moiety and activator are deposited at separate locations in step (c).

23. (ORIGINAL) A method according to claim 22 wherein in step (c) no activator containing drop is deposited at a same location as an attachment moiety containing drop.

24. (ORIGINAL) A method according to claim 22 wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (a) or (b), and wherein drops from dispensers which deposit different multi-dispenser drop groups are deposited and detected in step (c) in a test pattern area separate from the array.

25. (CURRENTLY AMENDED) A method of forming an addressable array of polymers on a substrate, comprising:

(a) for each of multiple locations on the substrate, depositing a reagent drop set during a cycle so as to attach a monomeric unit of the corresponding polymer for that

location; and

(b) repeating step (a), until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is deposited over one or more cycles of (a) and (b) for a corresponding location which group includes drops which are deposited from different dispensers;

the method additionally comprising:

(c) depositing and detecting drops at respective separate locations on the substrate from different dispensers which deposit a multi-dispenser drop group.

26. (CURRENTLY AMENDED) A method according to claim 25 wherein a multi-dispenser drop group comprises a drop including an attachment moiety which becomes attached at the location at which the ~~group~~ drop is deposited in step (a) or (b) but which does not become attached at a location in step (c).

27. (ORIGINAL) A method according to claim 25 wherein the polymers are biopolymers.

28. (ORIGINAL) A method according to claim 27 wherein a multi-dispenser drop group deposited during a cycle comprises a drop including the monomeric unit which will become attached at that location upon activation by an activator, and at least one other drop comprises the activator moiety, such that the monomeric unit and activator are deposited at separate locations in step (c).

29. (ORIGINAL) A method according to claim 25 wherein step (c) is performed between two cycles.

30. (ORIGINAL) A method according to claim 25 wherein step (c) is performed between two cycles, and performed again between another two cycles.

31. (ORIGINAL) A method according to claim 25 wherein drops are deposited and detected at respective separate locations on the substrate from all those dispensers which deposit a multi-dispenser drop group.

32. (ORIGINAL) A method according to claim 25 wherein in step (c) the drops are detected on the substrate.

33. (ORIGINAL) A method according to claim 25 additionally comprising capturing an image of drops deposited during step (c).

34. (ORIGINAL) A method according to claim 28 wherein step (c) is performed between two cycles, the method additionally comprising when an error in a monomeric unit or activator drop dispenser is detected then depositing further drops containing the monomeric unit or activator so as to correct the error.

35. (ORIGINAL) A method according to claim 26 wherein during step (a) or (b) drops of multi-dispenser drop groups are deposited at respective substrate locations such that one drop of the group contacts a previously deposited drop of the same group at the same location.

36. (ORIGINAL) A method according to claim 28 wherein the activator containing drop for multiple locations is deposited from a same dispenser.

37. (ORIGINAL) A method according to claim 25 wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (a) or (b), and wherein the drops deposited and detected in step (c) are deposited in a test pattern area separate from the array.

38. (CURRENTLY AMENDED) A method of forming multiple addressable arrays of chemical moieties on a substrate, comprising for each array:

(a) for each of multiple locations on the substrate, depositing a reagent drop set during a cycle so as to attach a corresponding moiety for that location; and

(b) repeating step (a) if required, until the addressable array is formed;

wherein multiple dispensers are used <u>over one or more cycles of (a) and (b)</u> to dispense drops to form the array, the method additionally comprising:

(c) depositing and detecting drops from the different dispensers at respective separate locations on the substrate, wherein the drops are deposited at a separate test pattern area between arrays with the number of locations of the test pattern area during any one cycle being less than one tenth the number of locations in the smallest of the arrays which the test pattern area is between.

39. (ORIGINAL) A method according to claim 38 wherein the number of locations of the test pattern area during any one cycle is not greater than ten times the number of the dispensers used to form an array during any one cycle.

40. (WITHDRAWN) An apparatus for forming an addressable array on a substrate, comprising:

(a) a deposition system having multiple dispensers each of which can dispense a reagent drop;

(b) a transport system to move at least one of the deposition system or the substrate;

(c) a drop detector;

(d) a processor which controls the deposition system and the transport system such that:

(i) for each of multiple locations on the substrate, a reagent drop set is deposited during a cycle so as to attach a corresponding moiety for that location; and

(ii) step (i) will be repeated if required, until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is deposited over one or more cycles for a corresponding location which group includes drops which are deposited from different dispensers and which drops are not independently detected at the corresponding location;

and such that:

(iii) drops from different dispensers which deposit a multi-dispenser drop group will be deposited and detected by the detector at respective separate locations on the substrate.

41. (WITHDRAWN) An apparatus according to claim 40 wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (i) or (ii), and wherein the drops deposited and detected in step (iii) are deposited in a test pattern area separate from the array.

42. (WITHDRAWN) An apparatus according to claim 40 wherein drops are deposited and detected at respective separate locations on the substrate from all those dispensers which deposit a multi-dispenser drop group.

43. (WITHDRAWN) A method according to claim 40 wherein the detector detects drops on the substrate.

44. (WITHDRAWN) A method according to claim 40 wherein the detector captures an image of deposited drops.

45. (WITHDRAWN) A method according to claim 40 wherein at least one of the drops of different multi-dispenser drop groups are deposited from a same dispenser.

46. (WITHDRAWN) An apparatus for forming an addressable array on a substrate, comprising:

(a) a deposition system having multiple dispensers each of which can dispense a reagent drop;

(b) a transport system to move at least one of the deposition system or the substrate;

(c) a drop detector;

(d) a processor which controls the deposition system and the transport system such that:

(i) for each of multiple locations on the substrate, a reagent drop set is deposited during a cycle so as to attach a corresponding moiety for that location; and

(ii) step (i) will be repeated if required, until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is

deposited over one or more cycles for a corresponding location which group includes drops which are deposited from different dispensers and which drops are not independently detected at the corresponding location;

and such that:

(iii) drops from different dispensers which deposit a multi-dispenser drop group will be deposited and detected by the detector at respective separate locations on the substrate in a test pattern area separate from the array.

47. (WITHDRAWN) An apparatus according to claim 46 wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (i) or (ii), and wherein drops from dispensers which deposit different multi-dispenser drop groups are deposited and detected in step (iii) in a test pattern area separate from the array.

48. (WITHDRAWN) An apparatus for forming an addressable array on a substrate, comprising:

(a) a deposition system having multiple dispensers each of which can dispense a reagent drop;

(b) a transport system to move at least one of the deposition system or the substrate;

(c) a drop detector;

(d) a processor which controls the deposition system and the transport system such that:

(i) for each of multiple locations on the substrate, a reagent drop set is deposited during a cycle so as to attach a corresponding moiety for that location; and

(ii) repeating step (i) until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is deposited over one or more cycles for a corresponding location which group includes drops which are deposited from different dispensers;

and such that:

(iii) drops from different dispensers which deposit a multi-dispenser drop group will be deposited and detected by the detector at respective separate locations

on the substrate.

49. (WITHDRAWN) An apparatus according to claim 48 wherein the multi-dispenser drop group is deposited during a cycle.

50. (WITHDRAWN) A apparatus according to claim 49 wherein step (i) is performed between two cycles.

51. (WITHDRAWN) A apparatus according to claim 49 wherein step (i) is performed between two cycles, and performed again between another two cycles.

52. (WITHDRAWN) A apparatus according to claim 49 wherein drops are deposited and detected at respective separate locations on the substrate from all those dispensers which deposit a multi-dispenser drop group.

53. (WITHDRAWN) A apparatus according to claim 49 wherein during step (i) or (ii) drops of multi-dispenser drop groups are deposited at respective substrate locations such that one drop of the group contacts a previously deposited drop of the same group at the same location.

54. (WITHDRAWN) A computer program product, comprising: a computer readable storage medium having a computer program stored thereon which, when loaded into a computer communicating with an apparatus for forming an addressable array on a substrate, performs the steps of:

(a) for each of multiple locations on the substrate, depositing a reagent drop set during a cycle so as to attach a corresponding moiety for that location; and

(b) repeating step (a) if required, until the addressable array is formed;

wherein, for each of multiple locations, a multi-dispenser drop group is deposited over one or more cycles for a corresponding location which group includes drops which are deposited from different dispensers and which drops are not independently detected at the corresponding location;

the steps additionally including:

(c) depositing and detecting drops at respective separate locations on the substrate from different dispensers which deposit a multi-dispenser drop group.

55. (WITHDRAWN) A computer program product according to claim 54, wherein different multi-dispenser drop groups are deposited at respective substrate locations in step (a) or (b), and wherein the drops deposited and detected in step (c) are deposited in a test pattern area separate from the array.

56. (WITHDRAWN) A computer program product according to claim 55 wherein step (c) is performed between two cycles.

57. (WITHDRAWN) A computer program product according to claim 55 wherein a multi-dispenser drop group comprises a drop including an attachment moiety which will become attached at that location upon activation by an activator, and at least one other drop comprises the activator moiety, such that the attachment moiety and activator are deposited at separate locations in step (c).

58. (WITHDRAWN) A computer program product according to claim 57 wherein in step (c) no activator containing drop is deposited at a same location as an attachment moiety containing drop.